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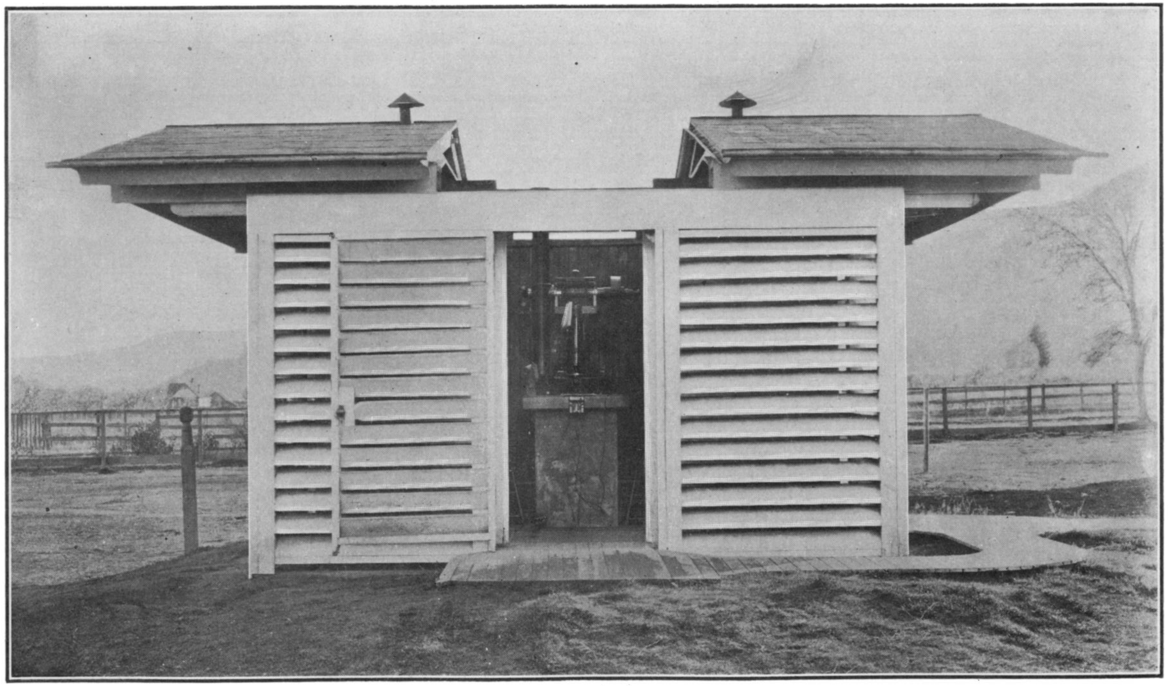

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ECLIPSES AND TRANSITS OF THE SATELLITES OF *SATURN* OCCURRING IN THE YEAR 1907.

By HERMANN STRUVE.

In the present year the cycle of eclipses and transits of the satellites of *Saturn* extends over all satellites, including *Titan*, and it is to be hoped that this very favorable opportunity of observing these interesting phenomena will not be lost. I have therefore computed the approximate times and places of the eclipses and transits for every day from June 20, 1907, to January 17, 1908.

In the following tables are first collected the data for the eclipses and transits of *Titan*, phenomena which can be observed also with smaller instruments. It would be of particular interest to observe the eclipses of *Titan* with photometers, the long duration of the appearances of *Titan* giving sufficient time for photometric comparisons. In the case of *Titan* it happens that both phenomena, the disappearance and the reappearance, are visible on the same day from the Earth. The times given for the eclipses of *Titan* are the moments when the center of the satellite passes the shadow-cone from the center of the Sun. For the transits of the shadow and of the disk of *Titan* the times of their crossing the minor axis of the planet are computed, and also the semi-duration of the transits, giving the approximate times of their ingress and egress on the disk of *Saturn*. It is to be understood that the predicted times depend greatly on the assumed values of the diameters of the planet and may deviate several minutes from the truth. Careful estimations of the times when the shadow on the disk of *Titan* is first or last seen on the planet will be very valuable.

The tables of the eclipses of the other satellites are arranged in the same manner as in the preceding year.[1] For these satellites only the disappearances are visible before opposition and only the reappearances after opposition. The first column contains the day of the month, the second the eclipsed satellite, the third the Greenwich time of the disappearance or reappearance, the last column, headed *s* and *p*, the geocentric place of the satellite at the time of his eclipse,—i. e. the distance of the satellite from the limb of the planet, and the position-angle, counted from the north point of the minor axis of the disk. The duration of the appearances, occurring this year nearly centrally, may be, in the case of *Rhea* several minutes, in the case of *Tethys* and *Dione* about one minute, in the case of *Mimas* and *Enceladus* only a few seconds. The attention of astronomers who are in possession of powerful instruments is particularly directed to these phenomena. On account of the disappearance of the rings before July 26th and after October 4th, and of their minuteness in the interval between those dates, it seems however very likely that in this year also instruments of moderate size can take part in these interesting observations.

It would be of great value also to ascertain the times of disappearance and reappearance of the rings by watching the planet carefully some days before and after the predicted dates. The observation of the first disappearance, on April 17th, will escape on account of the nearness of the Sun, but the reappearances of July 26th and January 7th and the disappearance of October 4th can be well observed.

Finally are added the approximate Greenwich times, when the shadows of the satellites *Tethys, Dione, Rhea* cross the minor axis of the disk, together with their distances from the center of the disk at the time of conjunction.

In the present opposition *Hyperion* also will be eclipsed at the times of his superior conjunction; but as it is doubtful whether these eclipses can be observed with sufficient accuracy I have not thought it worth while to calculate their times.

In the preparation of the following tables I was kindly assisted by Dr. P. GUTHERICK.

ROYAL OBSERVATORY, BERLIN, March, 1907.

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[1] See these *Publications*, Vol. XVIII, p. 203.

DISAPPEARANCE AND REAPPEARANCE OF THE RINGS OF *SATURN*.

1907.	April 17.	Disappearance.	The Earth in the plane of the rings.
	July 26.	Reappearance.	The Sun in the plane of the rings.
	October 4.	Disappearance.	The Earth in the plane of the rings.
1908.	January 7.	Reappearance.	The Earth in the plane of the rings.

ECLIPSES OF *TITAN*.

s and *p* denote the geocentric place of *Titan* at the time of its eclipse, i. e. the distance from the limb of the planet, and the position-angle, counted from the north point of the minor axis to the west or to the east.

			Gr. M. T.	*s*	*p*	
1907.	June 7	Disapp.	$1^h\ 23^m$	15″.8	104°	West.
	June 7	Reapp.	7 0	1 .4	128	
	June 23	Disapp.	0 27	17 .1	105	
	June 23	Reapp.	6 14	2 .0	130	
	July 8	Disapp.	23 33	17 .0	106	
	July 9	Reapp.	5 26	1 .5	134	
	July 24	Disapp.	22 40	15 .5	106	
	July 25	Reapp.	4 37	0 .0	141	
	Aug. 9	Disapp.	21 49	12 .5	105	
	Aug. 25	Disapp.	21 0	8 .0	104	
	Sept. 10	Disapp.	20 13	2 .6	101	
	Sept. 27	Reapp.	1 9	2 .2	91	East
	Oct. 13	Reapp.	0 15	6 .9	85	
	Oct. 28	Reapp.	23 19	10 .6	82	
	Nov. 13	Reapp.	22 22	13 .0	81	
	Nov. 29	Disapp.	16 56	0 .9	71	
	Nov. 29	Reapp.	21 22	13 .8	82	
	Dec. 15	Disapp.	16 27	1 .9	77	
	Dec. 15	Reapp.	20 19	13 .0	83	
	Dec. 31	Disapp.	16 3	2 .0	84	
	Dec. 31	Reapp.	19 9	10 .8	87	
1908.	Jan. 16	Disapp.	15 51	1 .9	93	
	Jan. 16	Reapp.	17 48	7 .3	92	

SHADOW OF *TITAN* AND DISK OF *TITAN*.

Crossing the minor axis of the planet at the distance *y* from the center.

			Gr. M. T.	*y*		Semi-duration of transit.
1907.	June 15	Shadow	$9^h\ 56^m$	1″.9	South	$3^h.0$
	June 15	Disk	16 2	6 .4	North	1 .7
	July 1	Shadow	9 5	1 .2	South	3 .0
	July 1	Disk	15 7	7 .0	North	1 .5
	July 17	Shadow	8 16	0 .5	South	3 .0
	July 17	Disk	13 48	7 .0	North	1 .6
	Aug. 2	Shadow	7 30	0 .2	North	3 .0
	Aug. 2	Disk	12 6	6 .3	North	2 .0
	Aug. 18	Shadow	6 43	0 .9	North	3 .0
	Aug. 18	Disk	9 51	5 .0	North	2 .5

			Gr. M. T.	*y*		Semi-duration of transit.
1907.	Sept. 3	Shadow	5^{h} 59^{m}	1″.6	North	$3^{h}.0$
	Sept. 3	Disk	7 42	3 .2	North	2 .8
	Sept. 19	Disk	5 14	1 .3	North	3 .0
	Sept. 19	Shadow	5 15	2 .3	North	2 .9
	Oct. 5	Disk	2 48	0 .7	South	3 .0
	Oct. 5	Shadow	4 33	2 .9	North	2 .9
	Oct. 21	Disk	0 31	2 .2	South	2 .9
	Oct. 21	Shadow	3 49	3 .6	North	2 .8
	Nov. 5	Disk	22 32	3 .1	South	2 .8
	Nov. 6	Shadow	3 5	4 .3	North	2 .6
	Nov. 21	Disk	20 46	3 .4	South	2 .8
	Nov. 22	Shadow	2 21	4 .9	North	2 .4
	Dec. 7	Disk	19 47	2 .9	South	2 .8
	Dec. 8	Shadow	1 34	5 .5	North	2 .1
	Dec. 23	Disk	19 2	1 .8	South	2 .9
	Dec. 24	Shadow	0 48	6 .2	North	1 .8
1908.	Jan. 8	Disk	18 42	0 .2	South	3 .0
	Jan. 8	Shadow	23 59	6 .8	North	1 .2
	Jan. 24	Disk	18 42	1 .7	North	3 .0
	Jan. 24	Shadow?	23 6	7 .4	North	?

ECLIPSES OF THE INNER SATELLITES OF *SATURN*, 1907.

DISAPPEARANCE BEFORE OPPOSITION.

s and *p* denote the geocentric place of the satellite at the time of its disappearance, i. e. the distance from the limb of the planet, and the position-angle, counted from the north point of the minor axis to the west.

		Gr. M. T.	*s*	*p*
June 20	Mi	0^{h} 42^{m}	2″.3	91° West
	Rh	4 2	7 .2	100
	Di	4 5	5 .2	99
	En	8 36	3 .2	96
	Te	20 29	3 .9	94
	Mi	23 19	2 .3	91
21	En	17 29	3 .2	96
	Mi	21 56	2 .3	91
22	Te	17 48	3 .9	94
	Mi	20 33	2 .3	91
	Di	21 46	5 .2	99
23	Ti D	0 27	17 .1	105
	En	2 22	3 .2	96
	Ti R	6 14	2 .0	130
	Mi	19 10	2 .3	91
24	En	11 15	3 .2	96
	Te	15 7	3 .9	94
	Rh	16 28	7 .3	100
	Mi	17 47	2 .3	91
25	Di	15 28	5 .2	99
	Mi	16 25	2 .3	91
	En	20 9	3 .2	96
26	Te	12 25	3 .9	94
	Mi	15 2	2 .3	91
27	En	5 2	3 .2	96
	Mi	13 39	2 .3	91
28	Di	9 10	5 .2	99
June 28	Te	9^{h} 44^{m}	3″.9	94° West
	Mi	12 16	2 .2	91
	En	13 55	3 .2	96
29	Rh	4 55	7 .4	100
	Mi	10 53	2 .2	91
	En	22 48	3 .2	96
30	Te	7 2	3 .8	94
	Mi	9 30	2 .2	91
July 1	Di	2 51	5 .2	99
	En	7 41	3 .1	96
	Mi	8 7	2 .2	91
2	Te	4 21	3 .8	94
	Mi	6 44	2 .2	91
	En	16 34	3 .1	96
3	Mi	5 21	2 .2	91
	Rh	17 22	7 .4	101
	Di	20 33	5 .2	99
4	En	1 27	3 .1	96
	Te	1 39	3 .8	94
	Mi	3 58	2 .2	91
5	Mi	2 36	2 .2	92
	En	10 21	3 .1	96
	Te	22 58	3 .8	94
6	Mi	1 13	2 .2	92
	Di	14 15	5 .1	99
	En	19 14	3 .1	96
	Mi	23 50	2 .2	92

		Gr. M. T.		s	p
July 7	Te	20h	17m	3″.8	94° West
	Mi	22	27	2 .2	92
8	En	4	7	3 .1	96
	Rh	5	49	7 .3	101
	Mi	21	4	2 .2	92
	Ti D	23	33	17 .0	106
9	Ti R	5	26	1 .5	134
	Di	7	56	5 .1	99
	En	13	0	3 .1	96
	Te	17	35	3 .8	94
	Mi	19	41	2 .2	92
10	Mi	18	18	2 .2	92
	En	21	53	3 .0	96
11	Te	14	54	3 .7	94
	Mi	16	55	2 .2	92
12	Di	1	38	5 .1	99
	En	6	47	3 .0	96
	Mi	15	33	2 .2	92
	Rh	18	16	7 .2	101
13	Te	12	12	3 .7	94
	Mi	14	10	2 .2	92
	En	15	40	3 .0	96
14	Mi	12	47	2 .2	92
	Di	19	20	5 .0	99
15	En	0	33	3 .0	96
	Te	9	31	3 .7	94
	Mi	11	24	2 .1	92
16	En	9	26	3 .0	96
	Mi	10	1	2 .1	92
17	Rh	6	43	7 .0	101
	Te	6	50	3 .7	94
	Mi	8	38	2 .1	92
	Di	13	1	5 .0	99
	En	18	19	3 .0	96
18	Mi	7	15	2 .1	92
19	En	3	12	2 .9	96
	Te	4	8	3 .6	94
	Mi	5	52	2 .1	92
20	Mi	4	30	2 .1	92
	Di	6	43	4 .9	99
	En	12	6	2 .9	96
21	Te	1	27	3 .6	94
	Mi	3	7	2 .1	92
	Rh	19	10	6 .7	100
	En	20	59	2 .9	96
22	Mi	1	44	2 .0	92
	Te	22	45	3 .5	94
23	Mi	0	21	2 .0	92
	Di	0	25	4 .8	99
	En	5	52	2 .8	96
	Mi	22	58	2 .0	92
24	En	14	45	2 .8	96
	Te	20	4	3 .4	94
	Mi	21	35	2 .0	92
	Ti D	22	40	15 .5	106
25	Ti R	4	37	0 .0	141
	Di	18	7	4 .7	99
	Mi	20	12	2 .0	92
	En	23	38	2 .8	96
26	Rh	7	37	6 .4	100
	Te	17	23	3 .3	94
July 26	Mi	18h	50m	1″.9	92° West
27	En	8	31	2 .7	96
	Mi	17	27	1 .9	92
28	Di	11	48	4 .6	99
	Te	14	41	3 .3	94
	Mi	16	4	1 .9	92
	En	17	25	2 .7	96
29	Mi	14	41	1 .9	92
30	En	2	18	2 .7	96
	Te	12	0	3 .2	94
	Mi	13	18	1 .8	92
	Rh	20	4	6 .2	100
31	Di	5	30	4 .5	99
	En	11	11	2 .6	96
	Mi	11	55	1 .8	92
Aug. 1	Te	9	19	3 .1	94
	Mi	10	33	1 .8	92
	En	20	4	2 .6	96
2	Mi	9	10	1 .8	92
	Di	23	12	4 .3	99
3	En	5	57	2 .5	96
	Te	6	37	3 .0	94
	Mi	7	47	1 .8	92
4	Mi	6	24	1 .7	92
	Rh	8	32	5 .8	100
	En	13	51	2 .5	96
5	Te	3	56	2 .9	94
	Mi	5	1	1 .7	92
	Di	16	54	4 .1	98
	En	22	44	2 .4	96
6	Mi	3	39	1 .7	92
7	Te	1	15	2 .8	94
	Mi	2	16	1 .7	92
	En	7	37	2 .3	96
8	Mi	0	53	1 .7	92
	Di	10	36	3 .9	98
	En	16	30	2 .3	96
	Rh	20	59	5 .4	100
	Te	22	33	2 .8	93
	Mi	23	30	1 .6	92
9	Ti	21	49	12 .5	105
	Mi	22	7	1 .6	92
10	En	1	24	2 .2	96
	Te	19	52	2 .7	93
	Mi	20	45	1 .6	92
11	Di	4	17	3 .7	98
	En	10	17	2 .2	95
	Mi	19	22	1 .5	92
12	Te	17	11	2 .6	93
	Mi	17	59	1 .5	92
	En	19	10	2 .2	95
13	Rh	9	26	4 .9	99
	Mi	16	36	1 .5	92
	Di	21	59	3 .5	98
14	En	4	3	2 .1	95
	Te	14	29	2 .5	93
	Mi	15	13	1 .5	92
15	En	12	56	2 .0	95
	Mi	13	51	1 .4	92
16	Te	11	48	2 .3	93
	Mi	12	28	1 .4	92

		Gr. M. T.		s	p
Aug. 16	Di	15^h	41^m	3″.3	98°West
	En	21	50	1 .9	95
17	Mi	11	5	1 .4	92
	Rh	21	53	4 .5	99
18	En	6	43	1 .8	95
	Te	9	7	2 .2	93
	Mi	9	42	1 .3	92
19	Mi	8	19	1 .3	92
	Di	9	23	3 .0	98
	En	15	36	1 .8	95
20	Te	6	25	2 .1	92
	Mi	6	57	1 .3	92
21	En	0	29	1 .7	95
	Mi	5	34	1 .3	92
22	Di	3	5	2 .8	97
	Te	3	44	2 .0	92
	Mi	4	11	1 .2	92
	En	9	23	1 .7	95
	Rh	10	21	3 .9	99
23	Mi	2	48	1 .2	92
	En	18	16	1 .6	95
24	Te	1	3	1 .9	92
	Mi	1	26	1 .2	92
	Di	20	47	2 .5	97
25	Mi	0	3	1 .1	92
	En	3	9	1 .5	95
	Ti	21	0	8 .0	104
	Te	22	22	1 .8	91
	Mi	22	40	1 .1	92
26	En	12	2	1 .4	95
	Mi	21	17	1 .1	92
	Rh	22	48	3 .4	98
27	Di	14	29	2 .3	97
	Te	19	40	1 .6	91
	Mi	19	55	1 .0	92
	En	20	56	1 .3	95
28	Mi	18	32	0 .9	92
29	En	5	49	1 .2	94
	Te	16	59	1 .5	91
	Mi	17	9	0 .9	92
30	Di	8	11	2 .0	96
	En	14	42	1 .2	94
	Mi	15	46	0 .8	92
31	Rh	11	16	2 .7	98
	Te	14	18	1 .4	91
	Mi	14	24	0 .8	92
	En	23	35	1 .1	94
Sept. 1	Mi	13	1	0 .7	92
2	Di	1	53	1 .8	96
	En	8	29	1 .0	94

		Gr. M. T.		s	p
Sept. 2	Te	11^h	37^m	1″.3	91°West
	Mi	11	38	0 .7	92
3	Mi	10	15	0 .7	92
	En	17	22	0 .9	94
4	Mi	8	53	0 .6	92
	Te	8	55	1 .1	90
	Di	19	35	1 .5	96
	Rh	23	43	2 .2	97
5	En	2	15	0 .8	94
	Mi	7	30	0 .6	92
6	Mi	6	7	0 .5	92
	Te	6	14	1 .0	90
	En	11	9	0 .7	94
7	Mi	4	44	0 .5	92
	Di	13	17	1 .2	95
	En	20	2	0 .7	94
8	Mi	3	22	0 .5	92
	Te	3	33	0 .8	90
9	Mi	1	59	0 .4	92
	En	4	55	0 .6	93
	Rh	12	11	1 .6	96
10	Mi	0	36	0 .4	92
	Te	0	52	0 .7	90
	Di	6	59	0 .9	95
	En	13	49	0 .5	93
	Ti	20	13	2 .6	101
	Mi	23	14	0 .3	92
11	Mi	21	51	0 .3	92
	Te	22	.11	0 .5	89
	En	22	42	0 .4	93
12	Mi	20	28	0 .2	92
13	Di	0	41	0 .6	94
	En	7	35	0 .3	93
	Mi	19	5	0 .2	92
	Te	19	30	0 .3	89
14	Rh	0	39	0 .7	95
	En	16	29	0 .2	92
	Mi	17	43	0 .1	92
15	Mi	16	20	0 .1	92
	Te	16	48	0 .2	89
	Di	18	23	0 .3	94
16	En	1	22	0 .1	92
	Mi	14	57	0 .0	92
17	En	10	15	0 .1	92
	Mi	13	35	0 .0	92
	Te	14	7	0 .1	89
18	Di	12	5	0 .1	93
	Mi	12	12	0 .0	92
	Rh	13	6	0 .1	94
	En	19	9	0 .0	92

REAPPEARANCE AFTER OPPOSITION.

s and *p* denote the geocentric place of the satellite at the time of its reappearance, i. e. the distance from the limb of the planet, and the position-angle, counted from the north point of the minor axis to the east.

		Gr. M. T.		s	p
Sept. 17	Mi	15^h	55^m	0″.0	95° East
	Te	17	6	0 .0	90
18	Mi	14	32	0 .0	95
	Di	15	25	0 .0	93
	Rh	17	3	0 .0	93

		Gr. M. T.		s	p
Sept. 18	En	21^h	49^m	0″.0	92°East
19	Mi	13	9	0 .0	95
	Te	14	25	0 .0	90
20	En	6	43	0 .1	92
	Mi	11	47	0 .1	95

		Gr. M. T.		*s*	*p*
Sept. 21	Di	9^{h}	7^{m}	0.″2	92°East
	Mi	10	24	0 .1	95
	Te	11	44	0 .1	90
	En	15	36	0 .2	92
22	Mi	9	1	0 .2	95
23	En	0	29	0 .3	91
	Rh	5	31	0 .6	92
	Mi	7	39	0 .2	95
	Te	9	3	0 .3	89
24	Di	2	50	0 .4	92
	Mi	6	16	0 .2	94
	En	9	23	0 .4	91
25	Mi	4	53	0 .3	94
	Te	6	21	0 .5	89
	En	18	16	0 .4	91
26	Mi	3	30	0 .3	94
	Di	20	32	0 .6	91
27	Ti	1	9	2 .2	91
	Mi	2	8	0 .4	94
	En	3	9	0 .5	91
	Te	3	40	0 .6	89
	Rh	17	58	1 .2	91
28	Mi	0	45	0 .4	94
	En	12	3	0 .6	91
	Mi	23	22	0 .4	94
29	Te	0	59	0 .8	89
	Di	14	14	0 .9	91
	En	20	56	0 .7	91
	Mi	22	0	0 .4	94
30	Mi	20	37	0 .5	94
	Te	22	18	0 .8	89
Oct. 1	En	5	50	0 .8	91
	Mi	19	14	0 .5	94
2	Rh	6	26	1 .8	90
	Di	7	56	1 .2	90
	En	14	43	0 .8	91
	Mi	17	52	0 .6	94
	Te	19	37	1 .0	88
3	Mi	16	29	0 .6	94
	En	23	36	0 .9	90
4	Mi	15	6	0 .6	94
	Te	16	56	1 .1	88
5	Di	1	38	1 .4	90
	En	8	30	0 .9	90
	Mi	13	43	0 .7	94
6	Mi	12	21	0 .7	94
	Te	14	15	1 .3	88
	En	17	23	1 .0	90
	Rh	18	53	2 .3	89
7	Mi	10	58	0 .8	94
	Di	19	20	1 .6	89
8	En	2	16	1 .1	90
	Mi	9	35	0 .8	94
	Te	11	34	1 .4	88
9	Mi	8	13	0 .8	94
	En	11	10	1 .1	90
10	Mi	6	50	0 .9	94
	Te	8	53	1 .5	88
	Di	13	2	1 .9	89
	En	20	3	1 .2	90
11	Mi	5	27	0 .9	93
Oct. 11	Rh	7^{h}	21^{m}	2″.9	88°East
12	Mi	4	5	0 .9	93
	En	4	57	1 .3	90
	Te	6	12	1 .7	88
13	Ti	0	15	6 .9	85
	Mi	2	42	1 .0	93
	Di	6	44	2 .2	88
	En	13	50	1 .3	89
14	Mi	1	19	1 .0	93
	Te	3	31	1 .8	87
	En	22	43	1 .4	89
	Mi	23	56	1 .0	93
15	Rh	19	49	3 .4	88
	Mi	22	34	1 .0	93
16	Di	0	26	2 .4	88
	Te	0	50	2 .0	87
	En	7	37	1 .5	89
	Mi	21	11	1 .0	93
17	En	16	30	1 .6	89
	Mi	19	48	1 .1	93
	Te	22	9	2 .0	87
18	Di	18	8	2 .6	88
	Mi	18	26	1 .1	93
19	En	1	24	1 .6	89
	Mi	17	3	1 .1	93
	Te	19	28	2 .2	87
20	Rh	8	16	3 .9	87
	En	10	17	1 .7	89
	Mi	15	40	1 .2	93
21	Di	11	51	2 .8	88
	Mi	14	18	1 .2	93
	Te	16	47	2 .3	87
	En	19	11	1 .7	89
22	Mi	12	55	1 .2	93
23	En	4	4	1 .8	88
	Mi	11	32	1 .3	93
	Te	14	6	2 .4	87
24	Di	5	33	3 .0	87
	Mi	10	10	1 .3	93
	En	12	57	1 .8	88
	Rh	20	44	4 .4	86
25	Mi	8	47	1 .3	93
	Te	11	25	2 .5	87
	En	21	51	1 .9	88
26	Mi	7	24	1 .3	93
	Di	23	15	3 .2	87
27	Mi	6	2	1 .4	93
	En	6	44	2 .0	88
	Te	8	44	2 .6	87
28	Mi	4	39	1 .4	93
	En	15	38	2 .0	88
	Ti	23	19	10 .6	82
29	Mi	3	16	1 .4	93
	Te	6	3	2 .7	87
	Rh	9	12	4 .9	85
	Di	16	57	3 .4	87
30	En	0	31	2 .1	88
	Mi	1	54	1 .5	93
31	Mi	0	31	1 .5	93
	Te	3	22	2 .8	87
	En	9	25	2 .1	88

		Gr. M. T.		s	p
Oct. 31	Mi	23^{h}	8^{m}	1″.5	93°East
Nov. 1	Di	10	39	3 .5	87
	En	18	18	2 .2	88
	Mi	21	46	1 .5	93
2	Te	0	41	2 .8	86
	Mi	20	23	1 .6	93
	Rh	21	40	5 .2	85
3	En	3	12	2 .2	88
	Mi	19	0	1 .6	92
	Te	22	0	2 .9	86
4	Di	4	22	3 .7	87
	En	12	5	2 .3	88
	Mi	17	38	1 .6	92
5	Mi	16	15	1 .6	92
	Te	19	19	3 .0	86
	En	20	59	2 .3	88
6	Mi	14	52	1 .7	92
	Di	22	4	3 .8	87
7	En	5	52	2 .4	88
	Rh	10	7	5 .5	85
	Mi	13	30	1 .7	92
	Te	16	38	3 .1	86
8	Mi	12	7	1 .7	92
	En	14	46	2 .4	88
9	Mi	10	44	1 .7	92
	Te	13	57	3 .2	86
	Di	15	46	4 .0	87
	En	23	39	2 .5	88
10	Mi	9	22	1 .8	92
11	Mi	7	59	1 .8	92
	En	8	33	2 .5	88
	Te	11	16	3 .2	86
	Rh	22	35	5 .7	85
12	Mi	6	36	1 .8	92
	Di	9	29	4 .1	86
	En	17	26	2 .5	88
13	Mi	5	14	1 .8	92
	Te	8	35	3 .3	86
	Ti	22	22	13 .0	81
14	En	2	20	2 .6	88
	Mi	3	51	1 .8	92
15	Mi	2	28	1 .9	92
	Di	3	11	4 .2	86
	Te	5	54	3 .3	86
	En	11	13	2 .6	88
16	Mi	1	6	1 .9	92
	Rh	11	3	6 .0	85
	En	20	7	2 .7	88
	Mi	23	43	1 .9	92
17	Te	3	13	3 .4	86
	Di	20	53	4 .3	86
	Mi	22	20	1 .9	92
18	En	5	0	2 .7	87
	Mi	20	58	1 .9	92
19	Te	0	32	3 .4	86
	En	13	54	2 .7	88
	Mi	19	35	1 .9	92
20	Di	14	35	4 .4	86
	Mi	18	12	1 .9	92
	Te	21	51	3 .4	86
	En	22	47	2 .7	88

		Gr. M. T.		s	p
Nov. 20	Rh	23^{h}	31^{m}	6″.2	85°East
21	Mi	16	50	1 .9	92
22	En	7	41	2 .8	88
	Mi	15	27	2 .0	92
	Te	19	10	3 .4	86
23	Di	8	18	4 .4	86
	Mi	14	4	2 .0	92
	En	16	34	2 .8	88
24	Mi	12	42	2 .0	92
	Te	16	29	3 .5	86
25	En	1	28	2 .8	88
	Mi	11	19	2 .0	92
	Rh	11	59	6 .3	85
26	Di	2	0	4 .5	86
	Mi	9	56	2 .0	92
	En	10	21	2 .8	88
	Te	13	48	3 .5	86
27	Mi	8	34	2 .0	92
	En	19	15	2 .8	88
28	Mi	7	11	2 .0	92
	Te	11	7	3 .5	86
	Di	19	42	4 .5	86
29	En	4	8	2 .8	88
	Mi	5	48	2 .0	92
	Ti D	16	56	0 .9	71
	Ti R	21	22	13 .8	82
30	Rh	0	27	6 .4	85
	Mi	4	25	2 .0	92
	Te	8	26	3 .5	86
	En	13	2	2 .8	88
Dec. 1	Mi	3	3	2 .0	92
	Di	13	25	4 .5	86
	En	21	55	2 .8	88
2	Mi	1	40	2 .1	92
	Te	5	46	3 .6	87
3	Mi	0	17	2 .1	92
	En	6	49	2 .9	88
	Mi	22	55	2 .1	92
4	Te	3	5	3 .6	87
	Di	7	7	4 .5	86
	Rh	12	54	6 .5	86
	En	15	42	2 .9	88
	Mi	21	32	2 .1	92
5	Mi	20	9	2 .1	92
6	Te	0	24	3 .6	87
	En	0	36	2 .9	88
	Mi	18	47	2 .1	92
7	Di	0	49	4 .5	87
	En	9	29	2 .9	88
	Mi	17	24	2 .1	92
	Te	21	43	3 .6	87
8	Mi	16	1	2 .1	92
	En	18	23	2 .9	88
9	Rh	1	22	6 .5	86
	Mi	14	38	2 .1	92
	Di	18	32	4 .5	87
	Te	19	2	3 .6	87
10	En	3	16	2 .9	88
	Mi	13	16	2 .1	92
11	Mi	11	53	2 .1	92
	En	12	10	2 .9	88

		Gr. M. T.		*s*	*p*
Dec. 11	Te	16h	21m	3″.6	87°East
12	Mi	10	30	2.1	92
	Di	12	14	4.5	87
	En	21	3	2.9	88
13	Mi	9	8	2.1	92
	Te	13	40	3.6	88
	Rh	13	50	6.4	87
14	En	5	57	2.9	88
	Mi	7	45	2.1	92
15	Di	5	56	4.5	88
	Mi	6	22	2.1	92
	Te	10	59	3.6	88
	En	14	50	2.9	88
	Ti D	16	27	1.9	77
	Ti R	20	19	13.0	83
16	Mi	4	59	2.1	92
	En	23	44	2.9	88
17	Mi	3	37	2.1	92
	Te	8	18	3.6	88
	Di	23	39	4.5	88
18	Mi	2	14	2.1	92
	Rh	2	18	6.4	87
	En	8	37	2.9	88
19	Mi	0	51	2.1	92
	Te	5	37	3.6	88
	En	17	31	2.9	89
	Mi	23	28	2.1	92
20	Di	17	21	4.4	88
	Mi	22	6	2.1	92
21	En	2	24	2.8	89
	Te	2	56	3.5	88
	Mi	20	43	2.1	92
22	En	11	18	2.8	89
	Rh	14	46	6.3	87
	Mi	19	20	2.0	92
23	Te	0	15	3.5	89
	Di	11	3	4.4	89
	Mi	17	38	2.0	92
	En	20	11	2.8	89
24	Mi	16	35	2.0	92
	Te	21	34	3.5	89
25	En	5	5	2.8	89
	Mi	15	12	2.0	92
26	Di	4	45	4.3	89
	Mi	13	49	2.0	92
	En	13	58	2.8	89
	Te	18	53	3.4	89
27	Rh	3	13	6.1	88
	Mi	12	27	2.0	92
	En	22	52	2.7	89
28	Mi	11	4	2.0	92
	Te	16	12	3.4	89
	Di	22	28	4.3	89
29	En	7	45	2.7	89
	Mi	9	41	2.0	92
30	Mi	8	18	2.0	92
	Te	13	31	3.3	89
	En	16	39	2.7	89
Dec. 31	Mi	6h	56m	2″.0	92°East
	Rh	15	41	5.9	88
	Ti D	16	3	2.0	84
	Di	16	10	4.2	89
	Ti R	19	9	10.8	87
1908					
Jan. 1	En	1	32	2.6	89
	Mi	5	33	1.9	92
	Te	10	51	3.3	89
2	Mi	4	10	1.9	92
	En	10	25	2.6	90
3	Mi	2	47	1.9	92
	Te	8	10	3.3	90
	Di	9	52	4.1	90
	En	19	19	2.6	90
4	Mi	1	25	1.9	92
5	Mi	0	2	1.9	92
	Rh	4	9	5.7	89
	En	4	12	2.5	90
	Te	5	29	3.2	90
	Mi	22	39	1.9	92
6	Di	3	34	4.0	90
	En	13	6	2.5	90
	Mi	21	16	1.9	92
7	Te	2	48	3.2	90
	Mi	19	43	1.9	92
	En	21	59	2.5	90
8	Mi	18	31	1.9	92
	Di	21	17	3.9	90
9	Te	0	7	3.1	90
	En	6	53	2.4	90
	Rh	16	37	5.5	90
	Mi	17	8	1.9	92
10	Mi	15	45	1.9	92
	En	15	46	2.4	91
	Te	21	26	3.0	91
11	Mi	14	22	1.9	92
	Di	14	59	3.8	91
12	En	0	40	2.3	91
	Mi	13	0	1.8	92
	Te	18	45	3.0	91
13	En	9	33	2.3	91
	Mi	11	37	1.8	92
14	Rh	5	5	5.1	91
	Di	8	41	3.6	92
	Mi	10	14	1.8	92
	Te	16	4	2.9	91
	En	18	27	2.3	91
15	Mi	8	51	1.8	92
16	En	3	20	2.2	91
	Mi	7	28	1.8	92
	Te	13	23	2.8	91
	Ti D	15	51	1.9	93
	Ti R	17	48	7.3	92
17	Di	2	23	3.4	92
	Mi	6	6	1.8	92
	En	12	14	2.2	91
18	Rh	17	33	4.8	91

SHADOWS OF THE SATELLITES OF *TETHYS, DIONE, RHEA.*

Crossing the minor axis of the disk at the distance y from the center.

		Gr. M. T.	y	
June 21	Di	$14^h.7$	$0''.3$	South
	Te	20 .8	0 .8	
22	Rh	12 .4	0 .5	
23	Te	18 .1	0 .8	
24	Di	8 .4	0 .2	
25	Te	15 .4	0 .7	
27	Rh	0 .8	0 .4	
	Di	2 .1	0 .2	
	Te	12 .7	0 .7	
29	Te	10 .0	0 .7	
	Di	19 .8	0 .1	
July 1	Te	7 .3	0 .7	
	Rh	13 .3	0 .3	
2	Di	13 .5	0 .1	
3	Te	4 .6	0 .6	
5	Te	1 .9	0 .6	
	Di	7 .2	0 .0	
6	Rh	1 .7	0 .2	
	Te	23 .2	0 .6	
8	Di	0 .9	0 .0	
	Te	20 .5	0 .6	
10	Rh	14 .2	0 .2	
	Te	17 .8	0 .5	
	Di	18 .6	0 .1	North
12	Te	15 .2	0 .5	South
13	Di	12 .3	0 .1	North
14	Te	12 .5	0 .5	South
15	Rh	2 .6	0 .1	
16	Di	6 .0	0 .2	North
	Te	9 .8	0 .5	South
18	Te	7 .1	0 .4	
	Di	23 .7	0 .2	North
19	Rh	15 .0	0 .0	
20	Te	4 .4	0 .4	South
21	Di	17 .4	0 .3	North
22	Te	1 .7	0 .4	South
23	Te	23 .0	0 .4	
24	Rh	3 .5	0 .1	North
	Di	11 .0	0 .3	
25	Te	20 .3	0 .3	South
27	Di	4 .7	0 .4	North
	Te	17 .6	0 .3	South
28	Rh	15 .9	0 .1	North
29	Te	14 .9	0 .3	South
	Di	22 .4	0 .4	North
31	Te	12 .2	0 .3	South
Aug. 1	Di	16 .1	0 .5	North
2	Rh	4 .4	0 .2	
	Te	9 .6	0 .2	South
4	Te	6 .9	0 .2	
	Di	9 .8	0 .5	North
6	Te	4 .2	0 .2	South
	Rh	16 .8	0 .3	North
7	Di	3 .5	0 .5	
8	Te	1 .5	0 .2	South
9	Di	21 .2	0 .6	North
	Te	22 .8	0 .1	South
11	Rh	5 .3	0 .4	North
Aug. 11	Te	$20^h.1$	$0''.1$	South
12	Di	14 .9	0 .6	North
13	Te	17 .4	0 .1	South
15	Di	8 .6	0 .6	North
	Te	14 .7	0 .1	South
	Rh	17 .7	0 .4	North
17	Te	12 .0	0 .0	
18	Di	2 .3	0 .7	
19	Te	9 .3	0 .0	
20	Rh	6 .2	0 .5	
	Di	20 .0	0 .7	
21	Te	6 .6	0 .0	
23	Te	3 .9	0 .0	
	Di	13 .6	0 .7	
24	Rh	18 .6	0 .6	
25	Te	1 .2	0 .1	
26	Di	7 .3	0 .8	
	Te	22 .6	0 .1	
28	Te	19 .9	0 .1	
29	Di	1 .0	0 .8	
	Rh	7 .0	0 .6	
30	Te	17 .2	0 .1	
31	Di	18 .7	0 .9	
Sept. 1	Te	14 .5	0 .2	
2	Rh	19 .5	0 .7	
3	Te	11 .8	0 .2	
	Di	12 .4	0 .9	
5	Te	9 .1	0 .2	
6	Di	6 .1	0 .9	
7	Te	6 .4	0 .2	
	Rh	7 .9	0 .8	
8	Di	23 .8	1 .0	
9	Te	3 .7	0 .3	
11	Te	1 .0	0 .3	
	Di	17 .5	1 .0	
	Rh	20 .4	0 .8	
12	Te	22 .3	0 .3	
14	Di	11 .2	1 .1	
	Te	19 .6	0 .3	
16	Rh	8 .8	0 .9	
	Te	17 .0	0 .4	
17	Di	4 .9	1 .1	
18	Te	14 .3	0 .4	
19	Di	22 .6	1 .1	
20	Te	11 .6	0 .4	
	Rh	21 .2	0 .9	
22	Te	8 .9	0 .4	
	Di	16 .2	1 .2	
24	Te	6 .2	0 .5	
25	Rh	9 .7	1 .0	
	Di	9 .9	1 .2	
26	Te	3 .5	0 .5	
28	Te	0 .8	0 .5	
	Di	3 .6	1 .2	
29	Te	22 .1	0 .5	
	Rh	22 .2	1 .1	
30	Di	21 .3	1 .3	

		Gr. M. T.	y	
Oct. 1	Te	$19^{h}.4$	0″.5	North
3	Di	15.0	1.3	
	Te	16.8	0.6	
4	Rh	10.6	1.1	
5	Te	14.1	0.6	
6	Di	8.7	1.3	
7	Te	11.4	0.6	
8	Rh	23.0	1.2	
9	Di	2.4	1.3	
	Te	8.7	0.6	
11	Te	6.0	0.6	
	Di	20.1	1.4	
13	Te	3.3	0.7	
	Rh	11.5	1.3	
14	Di	13.8	1.4	
15	Te	0.6	0.7	
16	Te	21.9	0.7	
17	Di	7.5	1.4	
18	Rh	0.0	1.3	
	Te	19.2	0.7	
20	Di	1.2	1.4	
	Te	16.6	0.7	
22	Rh	12.4	1.4	
	Te	13.9	0.8	
	Di	18.9	1.5	
24	Te	11.2	0.8	
25	Di	12.6	1.5	
26	Te	8.5	0.8	
27	Rh	0.9	1.5	
28	Te	5.8	0.8	
	Di	6.3	1.5	
30	Te	3.1	0.9	
31	Di	0.0	1.6	
	Rh	13.3	1.5	
Nov. 1	Te	0.5	0.9	
2	Di	17.7	1.6	
	Te	21.8	0.9	
4	Te	19.1	0.9	
5	Rh	1.8	1.6	
	Di	11.4	1.6	
6	Te	16.4	1.0	
8	Di	5.1	1.7	
	Te	13.7	1.0	
9	Rh	14.3	1.7	
10	Te	11.0	1.0	
	Di	22.8	1.7	
12	Te	8.3	1.0	
13	Di	16.5	1.7	
14	Rh	2.7	1.8	
	Te	5.6	1.1	
16	Te	3.0	1.1	
	Di	10.2	1.8	
18	Te	0.3	1.1	
	Rh	15.2	1.8	
19	Di	3.9	1.8	
	Te	21.6	1.2	
21	Te	18.9	1.2	
	Di	21.6	1.8	
23	Rh	3.6	1.9	
	Te	16.2	1.2	
24	Di	15.3	1.9	

		Gr. M. T.	y	
Nov. 25	Te	$13^{h}.6$	1″.3	North
27	Di	9.0	1.9	
	Te	10.9	1.3	
	Rh	16.1	2.0	
29	Te	8.2	1.3	
30	Di	2.8	2.0	
Dec. 1	Te	5.5	1.4	
2	Rh	4.6	2.1	
	Di	20.4	2.0	
3	Te	2.8	1.4	
5	Te	0.1	1.4	
	Di	14.2	2.1	
6	Rh	17.0	2.1	
	Te	21.5	1.5	
8	Di	7.9	2.1	
	Te	19.8	1.5	
10	Te	16.1	1.5	
11	Di	1.6	2.1	
	Rh	5.5	2.2	
12	Te	13.4	1.5	
13	Di	19.3	2.2	
14	Te	10.7	1.6	
15	Rh	18.0	2.3	
16	Te	8.0	1.6	
	Di	13.0	2.2	
18	Te	5.4	1.6	
19	Di	6.7	2.3	
20	Te	2.7	1.6	
	Rh	6.5	2.4	
22	Te	0.0	1.7	
	Di	0.4	2.3	
23	Te	21.3	1.7	
24	Di	18.1	2.3	
	Rh	18.9	2.5	
25	Te	18.6	1.7	
27	Di	11.8	2.4	
	Te	16.0	1.8	
29	Rh	7.4	2.5	
	Te	13.3	1.8	
30	Di	5.5	2.4	
31	Te	10.6	1.8	
1908.				
Jan. 1	Di	23.2	2.5	
2	Te	7.9	1.9	
	Rh	19.9	2.6	
4	Te	5.2	1.9	
	Di	17.0	2.5	
6	Te	2.6	1.9	
7	Rh	8.3	2.7	
	Di	10.7	2.6	
	Te	23.9	2.0	
9	Te	21.2	2.0	
10	Di	4.4	2.6	
11	Te	18.5	2.0	
	Rh	20.8	2.7	
12	Di	22.1	2.7	
13	Te	15.8	2.1	
15	Te	13.2	2.1	
	Di	15.8	2.7	
16	Rh	9.3	2.8	
17	Te	10.5	2.1	